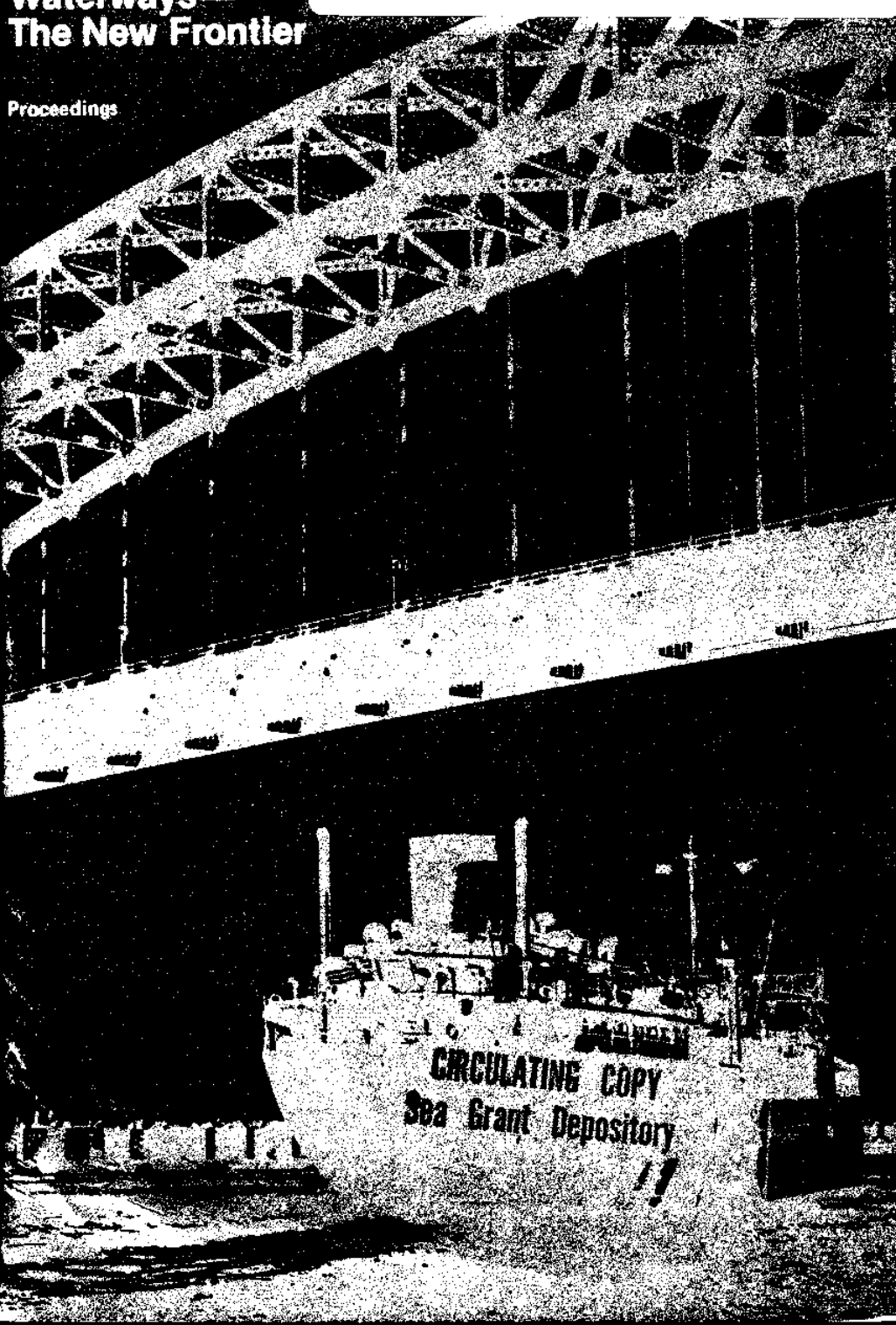
The Seas and the Waterways— The New Frontier

Proceedings



The Seas and the Waterways— The New Frontier

Proceedings

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Lecturer:

Yvonne Brathwaite Burke
Congresswoman
28th District, California

Moderator:

Dean A. Horn
Director
MIT Sea Grant Program

Panelists:

Paul E. Atkinson
President
Sun Shipbuilding and
Dry Dock Company

A. Douglas Carmichael
Professor of Power
Engineering
MIT Department of
Ocean Engineering

Erling D. Naess
Chairman
International Association of
Independent Tanker Owners
(INTERTANKO)

John P. Sheffey
Colonel, (Ret.) USA
National Association for
Uniformed Services

Yvonne Brathwaite Burke

Yvonne Brathwaite Burke was elected to the House of Representatives from the Twenty-eighth (then Thirty-seventh) Congressional District in Los Angeles, California, on November 7, 1972. Mrs. Burke, current Chair of the Congressional Black Caucus, was the first woman to be elected to Congress from California in twenty years, and the first black woman ever elected to the House from her state. She presently serves on the House Appropriations Committee with assignments on subcommittees handling HUD-Independent agencies, Department of State, Justice, Commerce, The Judiciary and Related Agencies, and the District of Columbia. Mrs. Burke also serves on the Select Committee on Assassinations.

A native of Los Angeles, Mrs. Burke graduated from Manual Arts High School, received a bachelor of arts degree in political science from the University of California at Los Angeles and a Juris Doctor's degree from the University of Southern California School of Law. She holds honorary Doctor of Law degrees from Virginia State College and Atlanta University.

Mrs. Burke was admitted to the California Bar in 1956, and for the next ten years, was an active practicing attorney and involved community leader. She served as a deputy corporation commissioner, a hearing officer for the Police Commission and as an attorney on the McCone Commission staff, which acted as the Watts Riots investigatory body.

From 1966 until her election to Congress, Mrs. Burke represented the Sixty-third District in the California State Assembly. During the 1971 and 1972 sessions, she chaired the Assembly Committee on Urban Development and Housing and served on the Health, Finance, and Insurance Committees. As a member of the state legislature, her efforts led to the enactment of laws that greatly benefited California's indigent children, health insurance consumers, residents of homes for the elderly and orphaned, and victims of governmental urban renewal and expansion projects.

Prior to her election to the House of Representatives, Mrs. Burke served as Vice-Chairperson of the 1972 Democratic National Convention in Miami Beach. There, in the absence of Party Chair Lawrence O'Brien, she presided over the longest, and perhaps, most volatile session in convention history. In the 1976 Democratic National Convention, Representative Burke served on the Drafting Subcommittee of the Democratic Platform Committee and was very active in drafting the Party's platform. She also chaired the Task Force on Foreign and Defense Policy, which drafted the foreign policy plank for the platform.

Since assuming office, Mrs. Burke has personally introduced more than twenty bills and major amendments. Enacted into law was legislation which provided funds for the initial planning of a comprehensive West Coast Mass Transit System, extended federal aid to autistic children, and ensured equal employment opportunity in the construction of the Trans-Alaskan pipeline. Mrs. Burke also introduced the Equal Opportunity for the Displaced Homemakers Act. This bill, if passed, will provide federally subsidized training for all individuals who had previously worked within the home without compensation, but who have been left, through death of a spouse or divorce, without adequate economic support.

Mrs. Burke has received numerous awards for her varied civic and governmental works. She has been selected Woman of the Year by the Los Angeles Times and the National Association of Black Manufacturers. Time Magazine selected her as one of America's 200 future leaders.

Mrs. Burke serves on the Board of Directors of the United Negro College Fund, the American Civil Liberties Union, Americans for Democratic Action, and the National Athletic Health Institute. She is also a member of the Board of Trustees serving the University of Southern California, a trustee of the University of West Los Angeles, and a Member of the UCLA Foundation. She is a Life Member of the National Council of Negro Women and a member of Alpha Kappa Alpha Sorority.

Paul E. Atkinson

Paul E. Atkinson has been President of Sun Shipbuilding and Dry Dock Company since July 1961. Sun Ship is located in Chester, Pennsylvania and is one of the nation's larger commercial shipyards.

Mr. Atkinson received his bachelor of science in naval architecture and marine engineering from the Webb Institute of Naval Architecture in 1942. Following graduation, he joined Sun Shipbuilding where he began work in the shipyard's production department. He progressed through a variety of assignments in the yard and in 1956 he was appointed Vice President and Director of Operations.

His direction of Sun Ship's efforts in ship construction has led to the shipyard's participation in several significant building programs:

. . . Construction of the roll-on/roll-off military transport—the Admiral William M. Callaghan—for use by the Military Sealift Command.

. . . Conversion of the S.S. Manhattan into an icebreaking tanker in only nine months for that vessel's historic assault in the Northwest Passage.

. . . Construction of the specialty vessel Hughes Glomar Explorer.

. . . Development of the roll-on/roll-off trailership to meet the growing worldwide need for truly intermodal sea transport.

. . . Design and construction of an "ecology" class tanker—a double hull vessel developed to operate in an environmentally sound fashion in the U.S. trade.

Mr. Atkinson has contributed his views on the U.S. shipbuilding industry's response to the Navy's shipbuilding programs in two appearances before the Seapower Subcommittee of the House Armed Services Committee.

Mr. Atkinson is the recipient of the 1976 Sea Grant Award, is an active member of the Marine Studies Advisory Board of the University of Delaware, a Sea Grant College, and is a trustee of the Webb Institute of Naval Architecture. He is a member of the American Bureau of Shipping and the American Committee of Lloyd's Register of Shipping, is a vice president of the Society of Naval Architects and Marine Engineers, and is a Director of the Shipbuilders Council of America.

A. Douglas Carmichael

A. Douglas Carmichael is Professor of Power Engineering in MIT's Department of Ocean Engineering, a position he has enjoyed since his appointment in 1970.

Dr. Carmichael's recent research concerns advanced power plants, propulsion, and wave energy conversion. He has also conducted experimental, design and system studies of a novel method of reducing tanker pollution during ballasting procedures.

In 1949, Dr. Carmichael received his bachelor's degree in engineering from London University, and subsequently was awarded his Ph.D. from Cambridge University. From 1949 to 1955 and again from 1958 to 1960, Dr. Carmichael was involved in design and research for aircraft gas turbines. In 1960 and 1961, he worked for Dracone Developments in England, as chief engineer working on flexible oil barges. He then worked at Northern Research Corporation in Cambridge, Massachusetts, from 1961 to 1964, doing energy-related research.

Dr. Carmichael has extensive teaching experience, beginning at Imperial College in London, where he taught Energy and Power, and related subjects. He also worked as an advisor in the Steam Turbine Division of English Electric Company from 1968 to 1970.

One of Dr. Carmichael's key activities at MIT has been the development of education programs in the Department of Ocean Engineering.

He has been instrumental in developing MIT's Ocean Engineering Summer Laboratory, in cooperation with the Maine Maritime Academy. Some of the projects developed in the Summer Laboratory include a constant depth buoy, a computer-controlled robot submarine, a pedal vehicle for scuba divers, a windmill-powered generator attached to a buoy, and a test for cable strumming by ocean currents.

Dr. Carmichael is associated with the MIT Innovation Center and is interested in innovation and the process of invention.

Erling D. Naess

Erling D. Naess has been Chairman of INTERTANKO (International Association of Independent Tanker Owners) since 1976. INTERTANKO members control about 80 million dwt of tankers, about 80 percent of the world's privately owned tanker fleet.

Mr. Naess was born in Bergen, Norway in 1901. He received his master's degree in economics at the Oslo University in 1920, and for four years continued to study economics at the Oslo University and the London School of Economics. In 1927, Mr. Naess participated in the pioneering of pelargic whaling and promoted Viking Whaling Co. Ltd. in London. From 1928 until the outbreak of World War II in 1939, Mr. Naess established several whaling, tanker and bulk carrier shipping companies in London. In 1942, he was appointed Deputy to the Director of the Norwegian Shipping and Trade Mission (Nortraship) in New York City.

In 1947, Mr. Naess started Norness Shipping Inc. with one Liberty ship. Norness Shipping Company grew into one of the largest shipping companies in the world with a fleet of more than 50 tankers and bulk carriers in 1973.

John P. Sheffey

John P. Sheffey is Executive Vice President of the National Association for Uniformed Services. From 1971 to 1974 he served as a special advisor in the Office of the U.S. Special Representative for Canal Negotiations, in the Department of State. As special advisor, Colonel Sheffey provided technical advice to the chief negotiator of canal operation and defense, assisted in the conduct of treaty negotiations, and assisted or represented the chief negotiator in consultations with the Congress and agencies of the Executive Branch.

From 1965 to 1970 Col. Sheffey was executive director of the President's Atlantic-Pacific Interoceanic Canal Study Commission. He directed planning and execution of a $22 million study of the feasibility of a new, sea-level isthmian canal. He planned, directed and coordinated studies of the foreign policy, defense, finance shipping and engineering aspects of canal construction and operation, working with the Congress, U.S. government departments, foreign governments and private contract agencies.

Col. Sheffey worked from 1961 to 1965 in the Office of the Secretary of the Army, providing staff support to the Secretary in his function as supervisor of the administration of the Panama Canal Company and the Canal Zone Government. At the request of the Canal Study Commission, Col. Sheffey left the Army in 1965 to become chief executive of the Commission in a civilian status.

Col. Sheffey was born in Marion, Virginia, in 1919 and received a master's degree in International Affairs from George Washington University in 1962. He earned his bachelor of science degree in engineering from the United States Military Academy in 1942. Col. Sheffey attended the Army War College (the Army's graduate-level school of national strategy) in 1960 and 1961.

In addition to his work, Col. Sheffey, who lives in Springfield, Virginia, is interested in investment management, business-government relations, population growth problems, and protecting the environment.

Mr. Horn:
Ladies and gentlemen, welcome to the Sixth Annual Sea Grant Lecture. My name is Dean Horn, and I am Director of the MIT Sea Grant Program and your host and moderator for this afternoon.

Shortly after the Sea Grant Program was founded at MIT in 1970, under the leadership of Dr. Alfred Keil, we sought to establish an annual event which would become a milestone in marine affairs. Thus we began the Sea Grant Lecture series to provide a forum for experts to review the crucial oceanic issues of the day and place them in a policy perspective for the future. This year's lecture, the sixth, is significant because it is being held during MIT's first year as a Sea Grant College.

President Wiesner had hoped to be here to introduce our lecturer, unanimously selected this year by the Faculty Sea Grant Council and the Sea Grant Policy Committee of the Institute, and to welcome you. Regretably, urgent business has prevented him from being here, but with great pleasure I have been given the honor of presenting to you Congresswoman Yvonne Brathwaite Burke, Representative of the 28th District of California.

Representative Burke serves on the House Appropriations Committee and the Department of State, Justice, Commerce, Judiciary and related-agency subcommittees. She is known as a friend and acting supporter of the National Sea Grant Program. But more than that, Mrs. Burke is a dedicated, active, hard-working and respected leader among her fellow representatives in Congress. She has introduced

over 20 bills and major amendments since she was elected to Congress in 1972. Many of these have produced milestone legislation, such as the Burke Amendment which bound federal pipeline funds to the enactment of an affirmative action program resulting in the award of $312 million in contracts to women and minority groups.

An imaginative and visionary new piece of legislation introduced by Mrs. Burke, the proposed Equal Opportunity for Displaced Homemakers Act, would provide federally subsidized training for all individuals who have worked in the home without compensation, but who have been left due to the death of a spouse or divorce without adequate economic support. In addition to her many varied civic and governmental efforts and activities, Mrs. Burke has received numerous awards. She has been selected Woman of the Year by the Los Angeles Times and by the National Association of Black Manufacturers. Time Magazine selected her as one of the nation's 200 future leaders. One final point: Mrs. Burke, a dynamic, knowledgeable and effective leader, is to me a perfect example of why the United States must fully utilize the abilities of our nation's women and of our minority citizens. To do otherwise is folly on the part of the United States. It is with singular pleasure that I present to you our Sixth Annual Sea Grant Lecturer, the Honorable Yvonne Brathwaite Burke. Mrs. Burke.

Mrs. Burke:

Thank you very much, Mr. Horn. Distinguished members of the panel, ladies and gentlemen, I am flattered indeed to be the Sea Grant lecturer for this year's MIT symposium. Because of my close association with many people in marine and oceanic affairs, I realize that this symposium has been a milestone event on the marine horizon. As I reviewed the list of lecturers, the names of Spilhaus, Frosch and others certainly make me feel that, as the first woman lecturer, I am joining a very distinguished group.

I chose the subject, "The Seas and the Waterways: The New Frontier," not just because this is a Sea Grant Lecture, nor because your state is one of the great maritime areas, but because of the importance the seas and waterways hold for America and, indeed, the future of the world. It is unfortunate, I think, that in a nation with such a rich maritime heritage, a majority of Americans still think of water principally as a means of quenching thirst; many more look upon the water only as a danger, a problem, a forbidding and hostile world. Land is considered the prime source of life. It is where we live, where we farm and where we mine. It is something we can own and improve.

We have become land-oriented creatures, though this has not always been true of Americans. It was not the original intent of the founders of communities around Massachusetts Bay to establish a predominately maritime community. The first and foremost objective of Winthrop and Dudley, Endicott and Saltonstall was to found a church and a commonwealth in which Calvinists and Puritans might live and worship. They intended the economic foundation of New England to be rooted in the land, but they failed. New England, out of stark necessity, was forced to turn to the sea when in 1641 civil war in England cut short the flow of immigrants and foreign commodities. The transition was made, however, with little difficulty. The oceans, bays and rivers literally cried to the colonists, "farm us!" Moreover, the founders had resourcefully recruited artisans with diverse skills and secured a variety of useful tools. Out of these circumstances the shipbuilding industry was launched.

Maritime trade flourished. American clippers were the most competitive trade carriers in the world. People read the signals from the ships and the signals of the sea. As the people's lives became intertwined with the sea, the youthful nation struggled for its place in the world. With much of the population concentrated along the seaboard, America sensed the pulse of the sea and derived vitality from it. Americans, however, began to turn their backs on the sea when they started to move westward in covered wagons to develop the land. Special schools, Land Grant colleges, were created to help the people conquer the problems and harvest the fruits of the nation's fertile soil. The creative talents of the people were attracted inland.

It was not until the nation was threatened by the sneak attack on Pearl Harbor in 1941 that America became interested again in the sea and marshalled her forces and people to become the greatest maritime power of all time. But, unfortunately, that position was short-lived. Following the war, our interest in the sea diminished, and we have witnessed in the years since then deterioration of our naval strength, deplorable near-destruction of our commercial maritime strength and a regrettable lack of marine and oceanic research. In my estimation, we have been shortsighted in failing to view the sea as essential to our quest for a better quality of life—and as crucial to our survival. The oceans are the last and greatest resource reserve on our planet. The oceans are vital to the maintenance of a healthy planet and the life form of that planet; they are a necessary medium for international trade and communication. To maintain our position in the world, we need to return some of our attention to the waters that surround us. As a member of Congress I am very pleased to report to you that our new Secretary of Commerce, Juanita Kreps, has indicated the administration's interest in working with the legislative branch to develop new initiatives and to establish a policy for the oceans. President Carter has indicated to us that he wishes to work not only to re-establish our military strength on the seas, but to resume a position of leadership in maritime commerce.

It was another president, Lyndon Johnson, who in 1966 gave us Sea Grant, one of the most revolutionary ideas of our time. MIT, a part of Sea Grant for more than six years, has achieved many successes in research, in marine advisory services and in education. I was personally happy to see the Institute honored this past year by the much coveted designation as a Sea Grant College. That designation made MIT only the twelfth institution in the United States to achieve this status and the first private institution to

receive such national recognition.

Sea Grant happens to be one of my favorite programs. I have seen the impact made in my community, Los Angeles, by the Sea Grant Program of the University of Southern California.

I have not been able to understand the attitude of the Office of Management and Budget over the years toward Sea Grant. Many of you may not be aware that support for the Sea Grant Program was diminishing as a result of "level funding." In inflationary years, if the money that goes into a program is not increased the program does not remain the same, it diminishes. And that, unfortunately, was the position the Office of Management and Budget took toward Sea Grant for many years. When Sea Grant was first started, little work was taking place in oceanography. We were aware of the great wealth and potential of the oceans and of the lack of development in marine science and education in the United States. We also knew that there was a tremendous demand for expertise in those areas, but not much was being done to change the situation. Fortunately, now we see our oceans being used as we look for minerals as well as for antitoxins for the treatment of cancer. We see the development of fish and saltwater farming. Sea Grant has been a great force in new and economic ways of fighting devastating beach erosion. It has developed ways of restoring damaged wetlands. It has helped commercial and sport fishermen, food processors, marina operators and a host of others. It has made progress in the development of marine curricula for youngsters. We have a program for inner-city youngsters in Los Angeles, where young people who have never seen the ocean have an opportunity to learn how the ocean is being developed.

It is not a secret that I would like to see higher funding of the Sea Grant Program. Many other members of Congress would also like to see Sea Grant get more money. It was primarily through the efforts of these people who feel the importance of this program that there was an increase of over $4 million in the Sea Grant Program budget for next year. But we're not happy with that. It is far below what an important program like Sea Grant should be receiving. And I can assure you that some of my colleagues and I will be a vocal group to see that Sea Grant gets the funding and attention it deserves.

Ship Registration

Now let me return to my recitation on America's maritime history. By the end of World War II, the United States was the most powerful nation of the sea. What happened? Well, in our usual altruistic manner, postwar America decided to use her maritime strength to help allies in trouble. In her great moment of altruism, she created the competitors and constraints that have literally destroyed the maritime advantage achieved by the end of the war. Much worse, the "fly-away-fleets" of American corporations were born to fly the Liberian and Panamanian flags. Lower standards of safety, tax dodges and cheap foreign labor replaced well-qualified and able-bodied seamen, and have resulted in threats to human life at sea and to our oceanic environment. Because of the impact that recent tragedies at sea have had on the lives, safety and well-being of Americans, I have become, as I hope you have, concerned about what is going on with ship registration and with ship safety.

Let us look at what happened between December 15, 1976 and January 15, 1977. In a period of 32 days, at least a dozen ships suffered major mishaps on or near American waters. As far as I can determine, only two of these vessels were of U.S. registry. Three were Panamanian and the other seven were Liberian. Liberia, a tiny West African nation with a population of one million, has more than 2,600 ships registered, and no natural seaport. The ships were registered in Panama and Liberia under a controversial concept known commonly as "flags-of-convenience." A flag-of-convenience is best defined as a flag of any country that will allow the registration of a foreign-controlled vessel under whatever conditions are convenient and opportune for the persons registering the vessel. And no one could be more familiar with the first and probably the worst disaster of the period, than all of you. I am speaking, of course, of the ARGO MERCHANT, a 640-foot, 18,743-ton Liberian tanker, which ran aground on Nantucket Shoals on December 15th, 24 miles off course with none of her navigational equipment working and loaded with 7.6 million gallons of thick industrial fuel oil. After a week of bad weather the ship broke up, releasing most of her cargo in surrounding waters. Fortunately, the same wind and sea conditions which caused the tanker's destruction blew the oil seaward, which was, by the way, exactly what MIT Sea Grant scientists had predicted through the use of an environmental model.

It is said that eight out of every ten maritime disasters can ultimately be traced to human error. Although mechanical malfunctions were also involved, human error was the main factor in the ARGO MERCHANT accident. At the time of the grounding, no one on board had taken an accurate navigational fix for more than 15 hours, a precaution normally undertaken every half hour on most ships. The ARGO MERCHANT had been involved in no less than 18 previous incidents, two of which were also groundings.

Another case, with which I am familiar because it took place off the coast of my home state, California, was a tragic explosion aboard the SANSINENA off Long Beach, December 17, 1976. The blast ripped a 300-foot gash in the hull of the Liberian tanker, killing nine crewmen and injuring 50 others. Damage to the harbor amounted to millions of dollars. I started looking into some of these incidents when I realized that most Americans were under the impression that it was the Liberians who were threatening their lives and ports. And while in a way that's true, because the ships are flying Liberian flags, a much larger share of the blame belongs on the conscience of international businessmen who are shielded from view. While we complain about Liberia, the fact is that Greek and U.S. interests own 30 to 35 percent of the Liberian fleet; Hong Kong interests own 10 to 15 percent, and the remainder is owned by countries all over the world.

I would like to talk about the SANSINENA. It was owned by Barracuda Tanker Company, formed by Peter Flan-

nigan and 26 associates, most of whom were investment bankers. In 1956, these prominent Americans bought three ships: the ill-fated SANSINENA, the TORREY CANYON, which broke up in 1967 in the biggest oil disaster in British history, and the LAKE PALOURDE, which I believe is still in service. Mr. Flannigan came to the White House in 1969 under President Nixon to oversee, among other things, merchant marine development, foreign trade and oil import policy. Flannigan's position is an appalling example of the lack of concern shown by many people in Washington for conflict of interest. However, though he was a very powerful man, he failed to be confirmed as ambassador to Spain. During Senate confirmation hearings in 1970, the long, sordid history of the acquisition of the SANSINENA unfolded. But it continued to sail, as the people of Long Beach will never forget.

Ship Safety Standards

It is estimated that only 17.5 percent of the value of waterborne exports and imports of the United States is shipped in vessels under the U.S. flag. We know why. The higher cost of transporting in ships of American registry is the reason this percentage is so small. Our taxes are higher; our wages are higher; our required safety standards are more costly. The costs of American registration are estimated to be three times that of Liberian registration. Our wage and safety standards are high in the United States and that, I think, is commendable. I take exception, however, that we allow ships of foreign registry to use the same harbors and transport our materials while they are violating our own safety regulations and paying substandard wages to their foreign crews.

It is not surprising that ship owners register in a country that does not regulate wages. It is possible to hire a Greek, Italian or Philippine crewman for $180 a month, rather than an American for $745 a month. In addition, it is less expensive to pay for cleaning up occasional oil spills than it is to bring ships up to safety standards. All this adds up to handsome profits.

What does this mean for the American economy? The Department of the Treasury estimates that flags-of-convenience permit American-owned firms to escape $100 million in U.S. taxes annually. More significantly, these flags-of-convenience deprive Americans of employment opportunities on ships, in shipyards and other industries. Some authorities say that if a modest 30 percent of U.S. oil imports were transported by U.S. flagships, it would result in the creation of 330,000 new jobs during the next three years. The jobs, so created, would represent 12 percent of the total number of jobs needed to satisfy a goal of five percent unemployment in 1980.

I believe regardless of the flags they fly, all ships should be made more safe, particularly the tankers. Oil is relatively innocuous when compared to the other alarmingly hazardous cargoes carried in today's tankers, like chlorine, sulfuric acid or the liquid natural gas (LNG), which is increasingly being imported. The import of LNG, in particular, will probably continue to increase in the years ahead. We have learned that destruction caused by tankers can be dangerous not only to our environment, but tragic for the people living in and near our seaports. We have seen the first generation of large crude oil carriers reach the end of their projected ten-year life span. Shippers are now thinking seriously of building tankers with ten times the cargo capacity of tankers such as the TORREY CANYON. It is inconceivable to even imagine the devastation that might be wrought by a 300 million gallon oil spill, but we must look realistically at this possibility.

We must concern ourselves with the fate of our oceans which could involve the fate of all mankind. I believe that a serious approach to matters of ship safety standards must be part of that concern. I read an article saying the Coast Guard had been ordered to inspect every tanker entering American ports as a precaution against accidents. I ask why has the Coast Guard not been inspecting ships all along? Congress enacted safety regulations in 1972 in the Ports and Waterways Safety Act. Where has the Coast Guard been for five years? Much more emphasis must be placed on the inspection of vessels entering U.S. ports. All ships entering our ports should be required to abide by the same safety standards that are demanded of U.S. ships.

A Worldwide Ocean Policy

Now let me turn to another subject. The complexities involved in developing a clear understanding of the oceans could not be highlighted more than they have been in the negotiations surrounding the Law of the Sea Conference. Ostensibly, the purpose of the conference has been to draw up a new and enlightened constitution of the sea. But the negotiations have increased the tensions and conflicts rather than fostering cooperation. There has been too little effort to define long-term goals which would contribute to the future of all people. Unfortunately, the conference appears to have attracted to the United Nations legalistic practitioners, many of whom are unfamiliar with the uses or the function of the sea. Lesser maritime nations, in particular, have looked to the United States for leadership during these lengthy negotiations. Because we have not established a strong national policy for the ocean, our representatives have been unable to provide the advice and counsel that have been expected of them.

Additionally, the United States has joined the maritime march to extend its boundaries and to husband what it considers its own coastal and fishery resources. With the passage of the Fisheries Conservation Management Act of 1976, the United States followed a precedent established by the Latin American nations to unilaterally extend their jurisdiction to a 200-mile sovereign limit. When the United States took its action, many other nations followed, in domino fashion. The establishment of these limits has not been without its problems. Both the struggles within the Law of the Sea Conference and the differences over the 200-mile limit underline the problem of achieving satisfactory jurisdiction over the seas and waterways.

My concern is that if we are to really have a world ocean, and it if is to

be a future frontier, the people of the world are going to have to be united. We cannot expect to have a future frontier without the freedom of the seas which nations have enjoyed throughout the years. Limited access or denial of access would destroy many opportunities which we now recognize the oceans offer: a wealth of minerals, hopes for medicine and an abundance of food.

Panama Canal Treaty

I would like to address another major problem facing our nation today, one that is in the headlines a great deal and one that centers on a waterway, the Panama Canal. I have had the privilege of visiting Panama and the canal to talk to many of the people in and out of politics. As you know, on September 7th we signed a treaty with Panama concerning this waterway connecting the Pacific and the Atlantic. Under the existing 1903 treaty, the United States pays $2.3 million annually. In the future, we will be paying $10 million. It is not only money that is involved in Panama, however. We have come to recognize that the people of Panama are very sensitive to our presence in their country. In the name of defense we have not only established bases and a military strength, but of perhaps greater symbolic significance we have our own government, the Canal Company, operating in the midst of a foreign nation. Does it make economic sense to spend $22 million to maintain a governmental organization in the middle of another country? That amount represents what we appropriate after the deduction of revenues.

There are many who argue about the strategic military position of the Panama Canal. I believe we can maintain the military bases and negotiate them as we do every other base throughout the world. But most military people say the canal itself is not defensible; its defense depends upon the attitudes of the people who live in Panama. It also depends upon the friendliness of our neighbors in Latin America and how they react to our presence in Panama. I believe we must retain our right to influence the operation of the canal, but I don't think we need to have schools, hospitals, stores and the accoutrements of a government in order to operate it. As the matter now stands, in the eyes of the people of Panama and of Latin America, the specter of colonialism hangs over the shoulders of the United States. I think we must be sensitive to the Panamanian people's concern that their country has been divided. In their eyes, the United States is curtailing expansion of their cities and impeding their ability to control their own destiny. These conflicts have made negotiations quite delicate. It is my hope that the debate over the ratification of the treaty does not so destroy good will and become so emotional that in the future we will not be able to have worldwide access to the canal. These canal negotiations, the treaty and the circumstances surrounding its ratification will have worldwide impact. The commercial and strategic importance of the canal cannot be overlooked. We must be sure that this agreement guarantees free passage over this significant checkpoint for the ships of all nations and that it will be ratified in a way that we do not undermine the friendship of our Latin American neighbors.

Marine Centers

As a Californian and a representative from a maritime state, I am very proud to be in the state that gave this nation John Fitzgerald Kennedy. He was a president who, out of concern for our ocean, recognized the need for a maritime policy. Perhaps one of his greatest moments as president came about in 1962. In one of the greatest displays of courage in this nation, he turned around the Soviet ships headed for Cuba, thereby refusing to give up our naval leadership. In that famous passage of his inaugural address when he said, "Ask not what your country can do for you, but what you can do for your country," it was obvious that he recognized the need for the United States to regain some of the strengths that have been whittled away. He recognized that we should provide an example in an unstable world. I wonder sometimes if we had some of our great leaders here today, such as President Kennedy, if we would be in our current position. He would, I think, be using some of the same energies he used to maintain our position on the sea to encourage Americans of all ages to understand the meaning of the seas and the waterways to their lives. I think that one more monument should be dedicated to our great President John F. Kennedy. There is a need in this nation to establish centers in which oceanic scholars from all over the world could come and work toward a greater understanding of the oceans and waterways.

I would urge that as leaders in oceanographic research, and as a tribute to the global vision of John Kennedy, a center for marine education be established at MIT in his name. It could be a center for human progress with a continuous flow of fresh, exciting and creative ideas. And it could provide a climate to help change the though patterns of a land conscious nation.

It would be devoted to many educational disciplines and not limited merely to science. Lawyers would be taught to understand the value and importance of the coastal lands and waters and the significance of international law of the sea. Business administration experts would be asked to help find new avenues of advancement for commerce on the sea and in the coastal zone. Engineers would be asked to develop greater leadership in future oceanographic development. Artists, journalists, economists, social scientists, political scientists, students of international studies, geologists, educators and others would have an opportunity and a setting for concentrating on the development of wiser uses of the oceans. It would be a place where authors, poets and historians could undertake new works on the reality and romance of the seas. An oceanic consortia of that nature could concentrate on developing greater research efforts, uninhibited by outside influences. It could search the seas for a cure for cancer or food for the world's growing population. It would be a center for the mobilization of oceanic intellectuals—a place where the advantages of their intellect and experience could be fully exploited. And I think it

would be an inspiration to all of us who are so concerned about the future of our planet.

Thank you.

Mr. Horn:
Thank you very much, Mrs. Burke, for an outstanding and inspiring lecture. I hope we'll be able to respond to the challenges and opportunities that you have outlined for us.

We are most fortunate to have with us today three distinguished panelists from industry and academia who are recognized authorities in their own right. A fourth panelist, Colonel John P. Sheffey was unable to be with us because he is in Walter Reed Hospital, having undergone emergency surgery three days ago. I understand he is recovering rapidly and we wish him a complete and speedy return to full health.

The first panelist is Paul Atkinson, President of the Sun Shipbuilding and Dry Dock Company. He has spent most of his professional career in the operation and construction of merchant and military ships, and he is head of the company which has pioneered the construction of tankers of innovative design. Double bottom tankers is one example.

Next, Professor A. Douglas Carmichael, Professor of Power Engineering at MIT, Department of Ocean Engineering. He has distinguished himself in both academia and in industry for his work and research in the field of power engineering. He served as an expert witness in investigations of the tanker ARROW grounding and the explosion aboard the tanker V.A. FOGG. He has been a consultant in the development of environmental impact statements on many tanker operations.

Next, Mr. Erling D. Naess, Chairman of the International Association of Independent Tanker Owners—Intertanko. Mr. Naess has been actively involved since 1928 in tanker and bulk carrier shipping operations in his native Norway, England and the United States. In 1947 he started Norness Shipping Company, which grew into one of the largest shipping companies in the world. In 1976 he was elected chairman of Intertanko, which controls about 80 percent of the world's privately owned tankers.

Gentlemen, I appreciate your taking time from busy schedules to be with us. To start, I would like to ask Mr. Atkinson for his views on the problems of the ship industry today. Paul.

Mr. Atkinson:
Thank you very much, Dean. I would like to begin with a discussion of Congresswoman Burke's concluding thought: the need for a national center for a forum dedicated to ocean study and research. The beginnings of such a national forum are implicit, I believe, in the concept of the Sea Grant Program. Congresswoman Burke's call to enlist the diverse talents of our people is appropriate, for only a multidisciplinary approach to the problems and opportunities that the oceans hold out to us will be effective and productive in the long run.

Early in our attempts at Sun Ship to find solutions to the immediate problems we face, it became evident to us that we could not arbitrarily isolate a specific problem in order to deal with it. Each specific problem was woven tightly into the fabric of the greater and the more complex whole.

To begin with the problems near at hand in terms of the more complex big picture orientation, we found it necessary to broaden the corporate overview by either adding oceanographers, economists and transportation analysts to our staff, or by tapping the specialized resources available at our universities, particularly the Sea Grant schools.

To digress for a moment, here is an example of one problem which required us to seek outside help: We had to dredge the Delaware River in order to get ships into our shipyard; we were then left with dredge spoils containing heavy metal trace elements which we had to dispose of. Who in a shipyard is an authority on heavy metal trace elements? Where could we go to get the information we needed? It has become obvious to us over a period of time that we must consult with specialists outside our business to provide specific expertise on a particular problem. As a consequence, I have become an advocate of the Sea Grant Program with its access to a pool of diverse talents: engineers, lawyers, metallurgists—a whole range of people needed to make the oceans work.

Our relationship to the Sea Grant universities has worked, I hope to their benefit as well as ours. Any meaningful attempt to devise a comprehensive national program to deal with oceanic matters must also involve the federal government as well as the industrial and academic communities, although the problem of incentive is present. It is very difficult in this huge, complex area to properly identify how incentives should be applied. Government involvement must be of a fundamental yet a critical nature; it must help establish general national goals, yet engender an atmosphere conducive to the attainment of these goals. The government's participation in oceanic research, however, must be a matter of more than just the government doing some thing, but of the government doing the right thing.

I am not overly optimistic about the government's ability to carry out the important tasks I've mentioned if its recent performance in maritime affairs is to be taken as a true barometer of its capabilities. U.S. maritime policy since the close of World War II has created a sterile atmosphere that encourages mediocrity while penalizing initiative. This sterile atmosphere has contributed significantly to the current condition of the U.S. maritime industry. A look at the maritime industry today shows the shipbuilding industry is in disarray. U.S. flag ships are carrying less than 10 percent of our foreign commerce, our once flourishing coast-wise trade is dwindling to the point of nonexistence, and our merchant marine is not composed of the best-equipped, safest and most suitable types of vessels.

Our Navy has not fared very well, either. In my view, the U.S. Navy vessels cost too much, they take far too long to build, and with particular regard to the sealift vessels, with which I am somewhat familiar, they are not reasonably suitable for their modern mission. Hopefully, the

past will not prove to be the prologue to our future efforts. Now is the time for fresh beginnings. It is the time for the federal government, the academic and industrial communities to harness and direct their individual talents toward the yet to be defined national goals. Fortunately, the bleak picture I have presented has been relieved by U.S. marine accomplishments that hold out hope for a brighter future.

First, the United States is the undisputed world leader in offshore drilling, and the continuing worldwide demand for our technology and our people assures us of a preeminent role in this industry in the near and the long-term future. The astounding attendance at the Houston Offshore Technology Conferences year-after-year bears testimony to the U.S. lead in this area.

Second, the United States has led the world in the development and exploitation of the shipping revolution in unitized freight. Containerships, trailerships and the entire unitized freight movement system owe their practical existence to U.S. ingenuity.

Last, but not least, the United States just recently defended the America's Cup and has been defending it successfully for 126 years. When one thinks about it, that is a convincing demonstration of our ability to marry advanced technology with hard work when our national maritime honor is at stake.

In a more somber vein, presently there is a massive move by the Soviets to increase their presence and influence on the high seas by an order of magnitude. This push is evident, particularly in the quantum increase in their merchant fleet. This increase, despite their prostestations to the contrary, is taking place in trades other than their own. They have become the major growing force of the "third country traders." Major economic confrontation is occurring in all of the major trade routes of the world. Their technology at the present time does not appear to approach ours in sophistication, but it is useful to speculate how long our lead can be sustained in the present economic climate. Your attention is invited to pronouncements by Soviet government officials regarding their changing naval strategy. The situation is one that deserves our thoughtful attention.

Returning now to Congresswoman Burke's clarion call for greater emphasis on ocean education, my view of the matter is simple. The oceans of the world are highly complex and are already the theater for major economic confrontation that can well lead to even more serious problems. There is every reason to proceed on a forced draft basis with a major increase in oceanic education programs. If we're to succeed in this last frontier, the oceans, two preconditions must exist. First, the government, the academic community and industry must come to agreement on national goals. And the atmosphere in which they work towards these goals must be one in which the particular American genius for innovation will be rewarded.

Thank you.

Mr. Horn:
Thank you very much, Paul. Next, Dr. Carmichael.

Dr. Carmichael:
Congresswoman Burke has presented her assessment of a wide range of topics relating to the seas and waterways. In her discussion of tanker safety, she quite naturally suggests legislative or regulatory measures to reduce the hazards. I intend to restrict my discussion to possible technical methods of alleviating environmental damage from tanker groundings such as the ARGO MERCHANT disaster. I'm making the assumption, I think with justification, that tanker accidents will always occur despite any improvement to equipment and crew training that result from changes in regulations applied to the operators of tankers.

In recent years, there have been three well-documented cases of such groundings. The TORREY CANYON ran onto rocks off Southwest England in March 1967, carrying about 120,000 tons of crude oil. The ARROW struck a rock in Chetabucto Bay, Nova Scotia in February 1970, carrying about 16,000 tons of Bunker C oil. The ARGO MERCHANT, as we all know, ran aground off Nantucket Island in December 1976, carrying 27,000 tons of heavy fuel oil.

There were striking similarities between these three incidents. The groundings were all attributed to errors of navigation, not weather, collision or mechanical failure, as one might have expected. The machinery rooms were soon flooded, immobilizing the pumping arrangements. The waves prevented off-loading of the cargo. The tankers all broke up within a few days, presumably from the combined influence of damage caused by the grounding, and the action of waves, currents and tides. The tankers released most of their cargoes into the sea. No attempts to clean up the oil spills in the vicinity of the tankers were made because of heavy seas and the lack of suitable equipment.

An examination of the events that occurred with these three disasters suggests that we should either attempt to provide protection from the waves for the stricken tankers or to develop methods for off-loading and clean-up suitable for the anticipated weather conditions. With some protection from the waves, the stricken tanker could be inspected for damage, portable pumps and cargo heaters could be put aboard, barges could be safely brought alongside, cargo could be pumped into the barges, and oil barriers and skimmers could be used to clean up any leakage of oil.

It appears then, that much can be accomplished if protection from waves can be provided. The requirements are that the breakwater should be easily carried to the site; they should be capable of being moored to protect the tanker; and they should reduce the energy of the predominant waves. I believe that with such a specification we should be able to provide the solution. The technology for such breakwaters will almost certainly come from the rubber industry with their experience of large, reinforced rubber structures. There are, of course, formidable technical problems with these temporary breakwaters because of their size. The dimensions, to provide protection from longer waves, will have to be very large. Such large devices will be very difficult to handle, deploy and moor.

With the protection from waves, it is still necessary to provide arrangements for moving the cargo and cleaning up oil spills. A recent suggestion to utilize large-scale burning of the cargo is worthy of investigation. Burning on the ocean surface is almost impossible to sustain with the heavier oil. Burning of the cargo directly to prevent it from getting to the ocean, utilizing special furnaces, may be a possible solution. Preliminary calculations indicate to burn the complete cargo of a large tanker in a reasonable time, the heat release will be extremely high. The result is likely to be very dangerous, but it may be acceptable as a procedure while barges are brought to the site.

If, as is possible, breakwaters turn out to be impractical for any reason, then it will be necessary to develop procedures which will operate successfully in heavy seas. These problems were discussed in a recent article by a colleague, Jerome Milgram, in the 1977 July/August edition of the MIT journal, Technology Review. This article, based on a Sea Grant report, discusses some innovative ways of coping with tanker groundings. He presents very clearly the logistical problem of providing the various pieces of equipment to off-load the tankers and to clean up oil spills.

It is obvious that it will be costly to respond to an environmental threat occurring anywhere on our coastline. The research and development effort, the provision of equipment at various bases around the coast and the training of operators will be expensive for events which, hopefully, will occur only infrequently.

I would like to return to the legislative versus technical solutions to the problem. It is obvious that when the ship operators are so negligent that they threaten the environment, then changes in regulations are called for. However, we should not strain the financial and manpower resources of the Coast Guard by imposing on them new duties which would prevent them from developing technical solutions. The ARGO MERCHANT disaster demonstrated that we were not able to provide methods of preventing potential ecological damage. It would be foolhardy to face the next significant tanker grounding without adequate technical solutions.

Thank you.

Mr. Horn:
Thank you, Doug. And now, Mr. Naess, may we ask for your comments please.

Mr. Naess:
Mrs. Burke, ladies and gentlemen, I need not tell you that I am highly flattered by being invited to be a panelist on this occasion. I am the chairman of the Independent Tanker Owners Association and in that position you will be pointing your accusing finger at me for all the oil spills and accidents that happen around the coast of the United States. Not only that, but Mr. Horn discreetly hid the fact that I am often regarded as the "father of the flags-of-convenience." I happen to be the first man who registered a merchant ship under a Panamanian flag. That was in 1930. After the second World War, I built up a fairly large fleet under the Liberian flag, and in 1958, took an active part in the establishment of the American Committee for Flags of Necessity. I became that association's first chairman, a position I held during the association's initial turbulent years. The association is now known as the Federation of American Controlled Shipping, whose members control over 35 million tons of modern tankers and bulk carriers which fly Liberian and Panamanian flags. These are the ships which Mrs. Burke, in her most excellent and stimulating lecture, called the "fly-away-fleets."

Why do these fleets exist? The answer is international competition. The competition is intense and there are nearly always more ships than cargoes. For the last several decades, operating costs under the U.S. flag have been about three times foreign costs. Burdened with these costs, U.S. flag vessels have been unable to participate in international shipping operations. Except for a relatively few subsidized ships—tankers and bulk carriers operating in the government aid and military cargo trades or in the protected domestic trades—for American companies in the international tanker and bulk carrier business, it's a question of operating under foreign flags or not at all. It is, therefore, wrong to use the term "fly-away." The ships are not transferred from the U.S. registry, and therefore do not fly away. If they were not under foreign flags, they would not exist under American control at all. They were built abroad, mostly in Japan, and are manned by foreign crews. Their standard of safety is not lower than that of U.S. flagships, since they were built to conform, with few exceptions, to U.S. Coast Guard rules. Even the most outspoken critics of flags-of-convenience, for instance, the Secretary General of the ITF, have publicly acknowledged that these American controlled ships rank among the best-operated vessels in the world. They cannot be said to deprive Americans of employment opportunities on ships, since if they were not operated under foreign flags with foreign crews, they would not be under American control at all.

Americans have become land-oriented creatures, not unlike citizens of several European countries which have attained an approximately equal standard of living. I speak from personal experience since I have, during my lifetime, operated ships under a number of European flags. Thanks to the opportunities for employment ashore, the populations of some of these countries have largely turned their backs on the sea. For instance, it became very difficult for me to man Dutch flag tankers with Dutch crews; I had to give it up. Employment ashore with life at home in close contact with family and friends was preferred to employment involving six to nine months continued absence from home. During the last 30 or 40 years the seafarers have come more and more from less developed countries, such as the Philippines, Hong Kong and Pakistan. Today the Philippines is one of the world's largest sources of seamen. Over 36,000 Philippine seamen and officers serve on close to 20 percent of the world's ocean-going ships owned and operated under the flags of the major

maritime nations, including Liberia. The internationalization of ship crews has been made possible by the development of cheap and efficient long-distance air transport. If you need a Philippine crew for a ship in Rotterdam, you can get it in a matter of days. I do not think that this development should be criticized; on the contrary, it should be welcomed. Why should we not employ excellent quality seamen who are eager to go to sea just because they are Philippine, Pakistani or Hong Kong Chinese? Why should they be deprived of the possibility of attaining a higher level of earnings than is available ashore in their own countries when they are willing to put up with life at sea away from home?

Mrs. Burke mentioned that at the end of World War II the United States, in its "usual altruistic manner," created competitors who largely destroyed the maritime preeminence of the United States as it existed at the end of the war. What happened was that the United States sold war-built ships for cash, at prices which at the time were by no means give-aways--but reasonable on the market at that time and reasonable by comparison with what the ships had initially cost. On behalf of Norway, I negotiated and purchased a great number of U.S. war-built ships for which Norway paid cash. In 1947, I purchased a Liberty ship from the U.S. Maritime Commission, for which I paid cash. Some of the ships built in the United States during the war were paid for with the aid of Lend-Lease facilities. The United States could not possibly itself have operated the vast fleet built during the war, and instead of laying the ships up and seeing them rust away, it was obviously in the United States' own interests to sell them. This does not mean that the United States was not altruistic after the war. The Marshall Plan is the greatest monument to generosity and altruism in history.

Comparative Safety Records

Mrs. Burke mentioned the ARGO MERCHANT stranding. I will certainly not defend the navigation, or lack of it, of that vessel, as disclosed during the U.S. Coast Guard and Liberian government hearings. But I have to put the record straight when Mrs. Burke compares accidents and strandings by the U.S. flag ships with a similar record of Liberian flag ships. The U.S. Department of Transportation last January compared the number of incidents involving oil discharge in U.S. waters by U.S. flag ships with a similar record of Liberian flag ships for the years 1973-75 and came up with the following figures.

	U.S. Flag	Liberian Flag
Groundings	21	3
Collisions/ rammings	30	2
Other casualties	7	2
Structure failures	174	47
Total volume of oil lost	3,019,328	287,723

These figures, which probably surprise you, are from a U.S. government source, not a Liberian source. They do not indicate that the standard of safety of U.S. flag tankers is greater than that of Liberia. On the contrary, Larry Ford of Chevron Shipping operates ships under the U.S. flag and the Liberian flag. His fleet under the U.S. flag is probably one of the finest in existence. He tells me, however, that the safety record of the Liberian section of the Chevron Shipping Company's fleet has a higher standard of safety than the American section.

Specifically on the subject of the ARGO MERCHANT: In my opinion, the vessel should never have been chartered to deliver a cargo in a U.S. port. Prior to the stranding of the ARGO MERCHANT, I tried getting the permission of the U.S. Department of Justice to talk to the U.S. oil companies as a group, urging them to become choosier when chartering tankers. Newly built tankers of the highest standard of safety and equipment are laid up around the world while millions of tons of old vessels are sailing, simply because they are able to accept a low freight. This, in spite of the old vessels having bad operational records, like the ARGO MERCHANT, and a reputation as notorious polluters. I never received the U.S. Department of Justice waiver, but the ARGO MERCHANT stranding did the job for me with a bang. From that time on, the oil companies have been issuing lengthy questionnaires the tanker brokers have to complete before tankers can be offered for charter. Ships establish a "track record." A system of identification of the "track record" of vessels and owners will provide the most effective safeguard against the repetition of the ARGO MERCHANT accident.

In that connection, I think it is appropriate to draw attention to the fact that the United States, advanced technologically in so many respects, is backward when it comes to ports. There should be no need in this day and age for small and old tankers to sail up rivers and waterways in the United States to discharge cargoes. The maximum size of a tanker able to discharge in a U.S. east coast port is about 70,000 tons—small by today's standards. The construction of offshore oil terminals would eliminate pollution dangers resulting from this backwardness. Two such offshore oil terminals have been in the planning stage for a long time in Louisiana and Texas, but have been delayed by resistance from the environmentalists and rough conditions demanded by the authorities concerned. The backwardness of the United States in regard to oil terminals has greatly increased its exposure to the danger of oil pollution. Environmentalists please note.

Mrs. Burke mentioned the substandard wages paid to foreign crews. The wages offered Philippine seamen are in accordance with the tariff of the National Seamen Board of the Republic of the Philippine's Department of Labor. It gives the Philippine seamen earnings which are equal to or greater than those they can obtain ashore. They receive ample protection by the National Seamen's Board before, during and after employment. It is, therefore, hard for me to swallow the talk which I hear so often in the United States about the substandard wages paid to foreign seamen, just because they are not up to the heavily subsidized wages paid to U.S. seamen. Fifty percent of the

Filipinos employed in international shipping have high school diplomas; an additional 40 percent are college graduates. The surprisingly high number of well-educated Philippine people going to sea is explained in part by the limited employment opportunities at home and by the comparatively high wages offered by international shipping. An ordinary seaman can earn a wage that is equal to, or even exceeds, the earning of dentists, nurses and engineers. In fact, I'm told that a Philippine seaman earns more than a judge in Manila.

Mrs. Burke created the impression that American safety standards are way above the standards of safety of foreign flag vessels. This is a very complex subject and it is dangerous to make sweeping statements. It is also a hot subject because the United States recently suggested new features for the design and equipment on all tankers calling at U.S. ports. Fortunately, the U.S. government recognizes the danger of the United States taking unilateral and insular action in an area where up to the present time, rules and standards have been established by international organizations such as IMCO. I hope, for that reason, that the way will be found to solve such controversial problems as segregated ballast tanks, double bottoms, etc. so that a uniform international standard of design and safety can be maintained.

On behalf of the world's independent tanker industry, I can assure you that we are ready to collaborate to the utmost with the U.S. Coast Guard, an institution for which we have the greatest respect and admiration. Inspection of all tankers calling at U.S. ports, under the U.S. and foreign flags, will not be opposed by us as long as it is done with the least possible delay. That navigational aids and equipment should be first-class on board all tankers calling at U.S. ports, is something on which we are all in complete agreement. At the same time, may I mention that the shore navigational aids must also be kept up to standard. I am told that this is not always the case in U.S. ports. In some areas, new and modern types of navigational aids are desirable to accommodate the tanker movement, particularly during severe winter conditions and darkness.

Canal Tolls

Now, I come to the question of the Panama Canal. Mrs. Burke's position is that the treaty, recently signed, must assure free passage for the ships of all nations. I know that what she means by free is not that it doesn't cost anything. Needless to say, I have no quarrel with that objective. Does she mean that passage is free as long as ships of all nations are prepared to pay the canal tolls which the Panamanian government, at its sole discretion, decides to levy? So far, the canal tolls have been reasonable, but is there any provision which denies the Republic of Panama, after the year 2000, the right to increase the tolls up to the maximum fee the traffic will bear? Another interesting question, of lesser importance, is whether the Republic of Panama will be in a position to use the canal as a weapon in the continued flag-of-convenience battle.

I cannot help mentioning, however, that in all the palaver and fuss, pomp and flourish about the new treaty, little attention has been paid to what the international shipping industry has to say about it, although we are expected to pay for it. There was a tremendous gathering of heads of state, but I'm not aware that the users of the canal, who are expected to pay, were invited. At least, I was not, as chairman of the International Independent Tanker Owners Association, nor were the chairmen of the International Chamber of Shipping and The American Institute of Merchant Shipping, as far as I know.

My remarks, so far, probably convey to you the impression that I am largely in disagreement with the contents of Mrs. Burke's lecture. I hurry to correct that impression. She said that "the oceans are the last and greatest resource reserve of our planet. And the oceans are vital to the maintenance of a healthy planet and the life forms of that planet." Nothing could be more true. I have for the last two years been fighting an uphill battle to reduce the pollution of the oceans. It is a problem which deserves the greatest attention of all the world's nations to prevent the destruction of the marine life upon which the very existence of mankind will ultimately depend. Since the basic theme of her lecture was a recognition of the importance of the oceans and the marine sciences, she and I are in complete agreement.

Thank you.

Mr. Horn:

I have noticed that Mrs. Burke has been taking some notes and I think we ought to give her the opportunity to respond. Mrs. Burke.

Mrs. Burke:

Thank you very much Mr. Horn. I agree with so much that has been said by the members of the panel. Professor Carmichael has pointed out something that we in Congress recognize. We have to have technical solutions, but as we develop these technical solutions, our legislative approach must embody the changing technology. In the past some of the legislation we have passed has not incorporated important engineering advances.

I would like to address some points made by Mr. Naess. He states that international competition necessitated flags-of-convenience. I know that. But I know, too, that we are not charged less for oil that is brought in ships on which wages are one-fourth of the pay to a seaman on a U.S. ship.

One reason I feel so strongly that the United States must start participating as a force in the maritime commerce is our balance of trade. The Secretary of Treasury has estimated that our balance of trade deficit this year will be about $25 billion. Oil will make up a substantial portion of that. At the same time, almost 50 percent of all our petroleum and our oil is being imported. And unless we make some dramatic changes in consumption and technology, we will find ourselves importing up to 85 percent of our needs. That would be a different level of competition from that we are talking about today.

Let me turn to natural gas supplies.

We don't know whether or not we are going to bring our natural gas into the country through pipes or utilize tankers, but on the west coast we have signed a contract to bring in Indonesian liquid natural gas (LNG); that LNG will be carried by someone. To help reduce our balance of trade deficit we are going to have to become more competitive in an expanding market.

Another factor we must consider is unemployment. It was 7.9 percent last month, and is still 14 percent among minorities. During my own lifetime many Americans have worked as merchant marines, and there are many other Americans who would like to. Of course, they are not going to work for $180 a month; they are going to ask for a living wage. At the present time we are subsidizing workers from other countries with our policy that allows ships with different weight standards, different safety standards, and pays lower wages to use our ports, but we as consumers pay the same money for the goods that are brought in. If we are interested in our own economy, not only should we see more ships manufactured within the United States, but we should encourage the utilization of American seafarers and merchant marines in operating the ships.

One point I thought was very interesting when I reviewed the Russian grain deal, was the requirement that a substantial portion of that grain had to be carried by Russian ships. Now, when we negotiate for sale of merchandise, I think that we as American citizens should begin to investigate how we can press to get more American-owned ships sailing under the American flag.

Now let me get to the issue of the Panama Canal and the concern about a toll charge in the future. I think it is true we have subsidized ships that have come through the Panama Canal over the last 70 years. We haven't even repaid the capital outlay for building the canal, so that when we say we have subsidized it, you and I have paid with our taxes for the ships to come through at a reduced toll.

The treaty doesn't provide for a sea-level canal, but it does provide a mechanism for the discussion and the moving forward of a sea-level canal. We recognize that the Panama Canal cannot take the big tankers. We know the Panama Canal, for really many purposes, is obsolete. And if we want to continue use of the canal without a three-stage pumping of oil, we're going to have to talk about a second canal, preferably a sea-level canal. The competitive threat of that canal will be sufficient to keep the Panama Canal tolls down. We have witnessed another method of control. In parts of the world where the canals have been closed ship owners have simply sent their vessels on alternative routes. There are many, many, not only threats, but also forces that come into play. Perhaps one of the greatest forces is the position of the United States in the future of that canal. We have agreed to defend the canal, and we know that Panama is not in a position to defend the region alone. Committing ourselves to defend the canal, we put ourselves in a key position to affect future operational policies of the canal.

It is obvious that there is a tremendous amount of international banking and investment in Panama. Most certainly the international banking community will have an impact. If what we understand is true, we're going to see Panama in a different position in the financial community with more industries and international banking opening up on the additional land they will have available. This will have an impact on that government.

We know there have been changes of dictators in Panama and different approaches to government. Between now and the year 2000 we don't know what kind of government there will be. It is not considered a long-term stable government. But that is not so much different from the situation in many other nations in Latin America and other parts of the world. It is really just one of the chances we have to take if we're going to be part of this world of nations. I don't believe that by placing the canal, in the year 2000, under the jurisdiction of the country in which it is situated, there will be any dramatic change in the future operation of that canal.

One final observation I would like to make: We don't like to be coerced, but we have to live with reality. We live with life as it is, not life as we would like it to be. We say we don't react to threats and we don't react to danger, but we don't shoot off an atomic bomb because we know that someone may shoot one back at us. So we live in an international scene where we do have to react to the realities of that scene. And the reality is, we're going to have to take into consideration the interests of many countries in that area of the world. Thank you.

Mr. Horn:
Thank you very much Mrs. Burke. Our hour has moved on. I would like to take a few questions from the audience.

Question:
I have a comment rather than a question. I was tempted to engage in the debate on several of the controversial topics raised here today. I think I will not, however, because of time and also because those issues too will pass. I would like to emphasize something said by Congresswoman Burke on the need for a marine center. From my point of view, this is the most important idea to come from this particular lecture. We need such centers. I say centers because I do believe the problems that have to be faced are problems that are broader than the people in any one locality can or should be addressing. The Sea Grant Program is, in fact, a sort of a model for this concept. I have great devotion to the Sea Grant Program in the United States, but that I think is not what Mrs. Burke was suggesting as a specific model. It is wrong at least in terms of scale.

We devote to our space efforts, important as they are, some 100 times the effort we devote to the oceans. Because of its size Sea Grant has not been able to make the kind of impact it should

have. The program has achieved success and received credit because it has been nearsighted; and I mean that in a very positive sense. It has paid attention to the immediate problems of industry and to the problems of people. It has, for various reasons, including one of scale, not paid attention to the problems at the horizon and beyond. And the point raised by Mr. Naess in support of the Congresswoman, that our devotion to the ocean as primary to the long-range health of our society implores us to look at the long-range issue though we are not as a nation doing that. And so I say that apart from the issues that get us excited and interested today—the Panama Canal, flags-of-convenience and so on--the most important thing we could dedicate ourselves to as a nation is the creation of marine centers. I think the future of our nation really revolves in large part around making that kind of commitment.

Question:
Do you think there should be a cargo preference on any other cargoes besides oil or are you primarily concerned with oil?

Mrs. Burke:
I emphasize oil, not because I feel there should be a cargo preference, but because I recognize that we will see a tremendous increase of imported oil in future years, which will greatly affect the deficit in our balance of payments. Our ambassadors involved in international negotiations on commerce and trade will play a key role in the matter. I believe that in certain situations they should press for utilization of American ships.

Question:
Who has the responsibility to see that this is done—Commerce or State?

Mrs. Burke:
Input will be required from both of them in some of the negotiations. Of course, your next question probably will be: If you have one department determining maritime policy and you have another department negotiating that policy, who is going to be authority over maritime matters? I think that is a very legitimate question which we will need to have answered.

Question:
I would like to make a comment to Congresswoman Burke. I think Congress must bear a great deal of responsibility for the high cost of our U.S. flag merchant marine insofar as you provide quite a bit of money through subsidies. A great deal of this is devoted to subsidies for, say, training in the maritime industry. You provide a closed-shop arrangement through labor laws which enable the unions to pretty much select who can be on a ship. It enables them to take that training money and control who they train. They also control the pensions. And through the negotiative process they can establish scales in the negotiations with many of the companies. You see, they are not negotiating in a real competitive way because of the operating-differential-subsidy formula which permits the company to recover the amount of money they contribute for that training. We have gradually increased the cost of operating these ships, and everything we seem to do to try to stimulate more trade doesn't really direct the attention to that factor which, as far as I can see, is really contributing to the additional cost. And furthermore, from the standpoint of looking at control in a competitive situation, when you have a labor organization that can control the training, can control who goes on the ship, can control the pensions and so forth, it is just the same as having an industry with an antitrust flavor to it.

Mrs. Burke:
Let me say that certainly the things you say are true, and that Congress does have to take responsibility. I do think, that at this point maritime unions are interested enough in increasing the use of American seamen and the number of American ships to create an atmosphere for trade-off. Currently you are seeing many examples of both industry and labor working to reach accord. And I believe that we have reached a time, though it's going to take a really conscientious, cooperative effort from both these groups, where we are going to pull together to solve some of these problems.

Question:
One of the underlying problems that the panel has really been discussing today is that of environmental damage from oil spills. There has been talk of governmental and regulatory solutions, and Dr. Carmichael concentrated on innovative technical solutions. But I think we have to look at the problem in a broader sense: the transport of oil. I think the long-range solution lies in a greater concentration of effort in developing renewable energy resources, such as solar energy, that don't require transport around the world. We may have no problem with oil spills in 20 years because there may be no oil to transport. Would you comment on this?

Mrs. Burke:
I think that that is very true. I think during today's lecture we have addressed some immediate problems. In the long run, I don't think we have a lot of choice. We're going to have to move in a different direction which will make us less dependent on oil. Certainly using the oceans will be very key in the development of alternative renewable sources to replace fossil fuels.

Question:
What are the chances of Congress establishing a scale effort like the Manhattan Project to develop solar energy? In fact, the technology does exist today for solar energy; it's just uneconomical. You can't produce solar energy at competitive prices. And yet I see no evidence of a Manhattan Project kind of effort to deal with economics of solar energy.

Mrs. Burke:
Believe me, every attempt is being made to support new experiments for trying to make solar energy really economical for

the small consumer as well as industry. It is not enough, I have to admit that. I'm one of the people who joins with the environmental caucus in saying that we spend disproportionate amounts in other areas without putting that money into solar research. If we did, it would be economical.

Question:
One thing pointed out by several panel members, and by the speaker, is the lack of consistency or the myopia, if you will, of government policy. But I think the consumer, the inhabitant of the earth, is caught in the bind between everybody else's hustle. Industry wants to make money. The government policies will be good if they go about it the "right way,"--the way we see it. The State Department breathes down the neck of the Coast Guard. I know from speaking to former Coast Guard officers that we don't always patrol too stringently because state says, "Don't make waves for country X." That is one of the reasons the Coast Guard doesn't clamp down. I, myself, stood on the deck of a tanker and watched an oil slick drifting toward Waikiki with a Coast Guard cutter right in the middle of it, but they didn't stop the ship, and I wonder who got to whom. So I'm afraid what has happened is that everybody's got his own piece of pie, his own solution, and nobody has stepped forward and said, "Look boys, knock it off; let's get together; let's go at this with a fusion of interests instead of with our own interests paramount." I think the old Smithian idea of enlightened self-interest leading automatically to progress has to be reexamined, because I think it doesn't automatically follow, that what will satisfy industry will necessarily satisfy the career diplomat, or the stock holder, or indeed, perhaps in the long run, the world, in which we all have to live live. Now perhaps this calls for some kind of Justinian to come along with a unified code But I do suspect sometimes, in pursuing our own particular interests, we tend to forget that it is an integrated, independent world in which we live.

Mr. Horn:
Thank you very much. I believe the time has progressed to an hour when we'll call the meeting to an end. I thank all of you for coming. I want in particular to thank our lecturer and the panelists for their very stimulating participation in the Sixth Annual Sea Grant Lecture and Symposium.

Colonel John P. Sheffey, Colonel, U.S. Army (Ret.) was unable to participate as a panelist at the Sixth Annual Sea Grant Lecture and Symposium because of illness. He has generously granted the Sea Grant Program permission to reprint excerpts from an appearance he made July 26, 1977 before the Panama Canal Subcommittee, Committee on Merchant Marine and Fisheries of the U.S. House of Representatives from which he planned to draw his remarks for the lecture.

I have been invited to testify as to the vital military and strategic interests of the United States in the Panama Canal. Please understand that my statements are based upon official positions taken by the Department of Defense in 1970 and a fairly good knowledge of subsequent official developments, but I have no official capacity today and speak only for myself in response to the questions you have given me.

What importance is the role of the Panama Canal and/or Canal Zone to the strategic and tactical mobility of U.S. armed forces?
This is a question that was studied exhaustively by the Department of Defense for the Canal Study Commission and more or less continuously ever since for the treaty negotiators. The finding reported to the Canal Commission by the Department of Defense in 1970, that I believe remains valid today, was quite simply stated:

"A transisthmian canal, either lock or sea-level, is of major and continuing importance to the national defense of the United States.

"The reasons for this are quite obvious. The United States has commitments in five oceans and a one and one-half ocean Navy. Most of the supplies for logistic support of U.S. forces in our three Pacific wars since 1941 went through the Panama Canal. Nearly all of the assault landing craft for our threatened invasion of Cuba went through the canal and made the eyeball-to-eyeball confrontation with Russia credible.

"The savings in steaming time and distance resulting from use of the canal during World War I and II by both naval and logistic support forces produced the important end benefit that ships could be at sea for the shortest period of time necessary to accomplish their mission. By eliminating the necessity of the long voyage around Cape Horn, the submarine operating area along the northeast coast of South America was bypassed and the necessity for ASW operations in the area was removed. It appears reasonable to assume that an advantage of this nature also would occur in future military operations in which the enemy has a significant naval capability."*

What significance is the Panama Canal and/or Canal Zone as a logistical focal point for U.S. defense?
The real importance of the Canal is in logistical support of military operations in the Pacific area. There is no alternative to surface ocean transport in sight for 90 percent of the tonnages that would be required in a future overseas war. We do not have the port capacity on the west coast to support even a Vietnam-sized war from there, and we do not have the means to support a Pacific war by sea transport around South America or Africa. It would require twice as many ships and twice as much material in transit to provide the same daily deliveries on the far end without the Canal as with it. We have neither the ships nor the supplies available.

The Canal Zone is a very valuable logistical base for operations in Latin America, the Caribbean, and the southern

*Quotation marks indicate verbatim extracts from the DoD 'Study of National Defense Aspects" Annex II to the Report of the Atlantic-Pacific Interoceanic Canal Study Commission, December 1 1970.

Pacific side. It has the only U.S.-con- facilities within 1,600 miles on the Atlantic side and 2,500 miles on the Pacific side. It has the only U.S. controlled air base within a thousand miles. It is a military communications and transportation crossroads for the hemisphere. It contains the only existing transisthmian pipelines for ship bunker oil and aviation fuel. In short, it is the only existing U.S. logistical base of any significance south of the United States.

How do you relate the various aspects of a U.S. military involvement and control in the Canal Zone to what you perceive as the foreign policy objectives of the United States?

The U.S. military presence in the Canal Zone and United States control of the canal poses a problem for the United States for which there is no enduring solution that would fully satisfy both Panama and the United States. No conceivable treaty can fully serve U.S. interests while accomplishing our foreign policy objectives of meeting Panama's aspirations and eliminating the image of colonialism. If we continue to insist upon treaty rights to guarantee unilaterally that the canal will be properly operated, defended, and always available to us in peace or war, we must accept a huge burden of international criticism and, most likely, occasional bloodshed in Panama as we have experienced in the past. If we meet all Panamanian and Third World desires by withdrawing entirely, Cuban and Russian meddling in Panama are a certainty, as is political denial of the canal to the United States at some critical moment in the future. There should be no illusions about this. Latin America has serious and growing problems. I believe that further attempts at exploitation of these problems by the communist powers are inevitable and will increasingly threaten U.S. interests. Equally intelligent and patriotic men disagree on what course best serves the U.S. interests in Panama.

I believe that the United States should agree to give up much of the Canal Zone and eventually turn operational control of the canal over to Panama, but we should insist on permanent, irrevocable, and unambiguous rights to insure the continued operation and defense of the canal in any circumstances whatever. Panama objects to this, but it is the price the United States should demand for the enormous gift of the canal and most of the zone. A great power has to bear the burden of criticism that protection of its interests induces. In spite of the sound and fury, the world accepts this reality. I do not believe that anything we do in Panama will have any real lasting effect on our interests elsewhere. Our actions should be based on what we believe is fair and important to our future security—not on what our foreign critics believe. Our defense interests in the canal are critical and enduring. The goodwill that might be generated by relinquishing them would be ephemeral.

The MIT Sea Grant Program

The MIT Sea Grant Program is dedicated to the vital role of technology in the wise use of ocean and coastal zone resources, and to the expansion of human activities in and on the seas. Through the research, education, and advisory services sponsored and coordinated by its Sea Grant Program, MIT works toward the attainment of major economic and environmental goals for the seas and coasts, and guides industry, government, organizations, and citizens toward the realization of new opportunities in the oceans.

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For more information on specific projects or on program participation, contact the MIT Sea Grant Program office, Room 1-211 MIT, phone 617/253-7041.

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The MIT Sea Grant Program presents the annual Sea Grant Lecture to provide a forum for discussion of perspectives and opportunities for our current and future uses of the seas. The Lecture also explores and heightens awareness of the roles of engineering, science, and the social sciences in developing marine resources, reflecting the Institute's commitment to environmentally balanced development of the oceans and coasts.

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